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CLAIMS

What is claimed is:

1. A wireless communication system having outer loop transmission power control in which user data is signaled in both shared channels available to unspecified wireless transmit receive units (WTRUs) and dedicated channels that are assigned for use by a specific WTRU in which the WTRU transmits data signals on an uplink dedicated channel (UL DCH) and sporadically transmits data signals on an associated uplink shared channel (UL SCH), the communication system comprising:

a network unit including:

a receiver for receiving UL user data from WTRUs on UL DCHs and at least one UL SCH; and

a processor for computing target metrics for UL DCHs based on the reception of signals transmitted by a WTRU on an UL DCH associated with an UL SCH usable by the WTRU;

a shared channel target metric generator configured to output a respective UL SCH target metric derived from each computed UL DCH target metric; and

WTRUs, each including:

a processor which computes transmit power adjustments as a function of target metrics for UL channels;

said processor configured to compute UL DCH power adjustments for an UL DCH associated with an UL SCH as a function of UL DCH target metrics computed by said network unit based on the reception of signals transmitted by the WTRU on the UL DCH; and

said processor configured to compute UL SCH power adjustments for the associated UL SCH as a function of the respective UL SCH target metrics output from the shared channel target metric generator; and

a transmitter operatively associated with said WTRU's processor for transmitting user data on the UL DCH and associated UL SCH at respective

power levels corresponding to respective computed UL DCH and UL SCH power adjustments.

2. The invention of claim 1 wherein said network unit includes said shared channel target metric generator.

3. The invention of claim 2 in which the target metrics are target signal to interference ratios (SIRs) and the communication system has open loop transmission power control for WTRU transmissions wherein:

said network unit includes a transmitter configured to transmit DCH and SCH target SIRs; and

said WTRUs each include a receiver configured to receive respective DCH and SCH target SIRs such that the WTRU's processor computes power adjustments based on received DCH and SCH target SIRs.

4. The invention of claim 2 in which the target metrics are target signal to interference ratios (SIRs) and the communication system has closed loop transmission power control for WTRU transmissions wherein:

said network unit includes:

a component configured to produce DCH and SCH power step commands as a function DCH target SIRs computed by said network unit's processor and SCH target SIRs generated by said shared channel target metric generator; and

a transmitter configured to transmit DCH and SCH power step commands; and

said WTRUs each include a receiver configured to receive respective DCH and SCH power step commands such that the WTRU's processor computes power adjustments based on received DCH and SCH power step commands.

5. The invention of claim 2 in which the target metrics are target signal to interference ratios (SIRs) and the communication system is a Universal Mobile Telecommunications System (UMTS).

6. The invention of claim 5 in which the UMTS has open loop transmission power control for WTRU transmissions and the SCHs for which SCH target SIRs are generated are High Speed Shared Information Channels (HS-SICHs) which operate in conjunction with High Speed Downlink Shared Channels (HS-DSCHs) wherein:

said network unit is a UMTS Terrestrial Radio Access Network (UTRAN) that includes a transmitter configured to transmit DCH and HS-SICH target SIRs; and

said WTRUs each include a receiver configured to receive respective DCH and HS-SICH target SIRs such that the WTRU's processor computes power adjustments based on received DCH and HS-SICH target SIRs.

7. The invention of claim 5 in which the UMTS has closed loop transmission power control for WTRU transmissions and the SCHs for which SCH target SIRs are generated are High Speed Shared Information Channels (HS-SICHs) which operate in conjunction with High Speed Downlink Shared Channels (HS-DSCHs) wherein:

said network unit is a UMTS Terrestrial Radio Access Network (UTRAN) that includes:

a component configured to produce DCH and HS-SICH power step commands as a function DCH target SIRs computed by said network unit's processor and HS-SICH target SIRs generated by said shared channel target metric generator; and

a transmitter configured to transmit DCH and HS-SICH power step commands; and

said WTRUs each include a receiver configured to receive respective DCH and HS-SICH power step commands such that the WTRU's processor computes power adjustments based on received DCH and HS-SICH power step commands.

8. The invention of claim 1 wherein said WTRUs each includes a shared channel target metric generator.

9. The invention of claim 8 in which the target metrics are target signal to interference ratios (SIRs) and the communication system has open loop transmission power control for WTRU transmission wherein:

said network unit includes a transmitter configured to transmit DCH target SIRs; and

said WTRUs each include a receiver configured to receive respective DCH target SIRs such that the WTRU's processor computes power adjustments based on received DCH target SIRs and SCH target SIRs generated by the WTRU's shared channel target metric generator based on received DCH target SIRs.

10. The invention of claim 8 in which the target metrics are target signal to interference ratios (SIRs) and the SCHs for which SCH target SIRs are generated are High Speed Shared Information Channels (HS-SICHs) which operate in conjunction with High Speed Downlink Shared Channels (HS-DSCHs).

11. The invention of claim 10 in which the communication system is a Universal Mobile Telecommunications System (UMTS) that has open loop transmission power control for WTRU transmissions wherein:

said network unit is a UMTS Terrestrial Radio Access Network (UTRAN) that includes a transmitter configured to transmit DCH target SIRs; and

said WTRUs each include a receiver configured to receive respective DCH target SIRs such that the WTRU's processor computes power adjustments based on received DCH target SIRs and HS-SICH target SIRs generated by the

WTRU's shared channel target metric generator based on received DCH target SIRs.

12. A serving wireless transmit receive unit (WTRU) for implementing transmission power control for other WTRUs where user data is signaled to the serving WTRU by the other WTRUs in both up link (UL) shared channels available to unspecified WTRUs and dedicated UL channels that are assigned for use by a specific WTRU in which the specific WTRU transmits data signals on an uplink dedicated channel (UL DCH) and sporadically transmits data signals on an associated uplink shared channel (UL SCH) and where the other WTRUs each include a processor which computes UL channel power adjustments for an UL DCH and an associated UL SCH as a function of UL target metrics computed by the serving WTRU, the serving WTRU comprising:

a receiver for receiving UL user data from other WTRUs on UL DCHs and at least one UL SCH;

a processor for computing target metrics for UL DCHs based on the reception of signals transmitted by a WTRU on an UL DCH associated with an UL SCH usable by the WTRU; and

a shared channel target metric generator configured to output a respective UL SCH target metric derived from each computed UL DCH target metric.

13. The invention of claim 12 in which the target metrics are target signal to interference ratios (SIRs).

14. The invention of claim 13 wherein the serving WTRU is configured for use in a Universal Mobile Telecommunications System (UMTS) as a UMTS Terrestrial Radio Access Network (UTRAN) that has open loop transmission power control for WTRU transmissions and the SCHs for which SCH target SIRs are generated are High Speed Shared Information Channels (HS-SICHs) which

operate in conjunction with High Speed Downlink Shared Channels (HS-DSCHs), the UTRAN further comprising:

a transmitter configured to transmit DCH and HS-SICH target SIRs whereby said other WTRUs compute power adjustments based on DCH and HS-SICH target SIRs received from the UTRAN transmitter.

15. The invention of claim 13 wherein the serving WTRU is configured for use in a Universal Mobile Telecommunications System (UMTS) as a UMTS Terrestrial Radio Access Network (UTRAN) that has closed loop transmission power control for WTRU transmissions, the UTRAN further comprising:

a component configured to produce DCH and HS-SICH power step commands as a function DCH target SIRs computed by said processor and HS-SICH target SIRs generated by said shared channel target metric generator; and

a transmitter configured to transmit DCH and HS-SICH power step commands whereby said other WTRUs compute power adjustments based on DCH and HS-SICH power step commands received from the UTRAN's transmitter.

16. A wireless transmit receive unit (WTRU) having a transmission power control for a wireless communication system in which user data is signaled in both shared channels available to unspecified WTRUs and dedicated channels that are assigned for use by a specific WTRU in which the WTRU transmits data signals on an uplink dedicated channel (UL DCH) and sporadically transmits data signals on an associated uplink shared channel (UL SCH), the WTRU comprising:

a receiver for receiving target metrics for the UL DCH that have been computed based on the reception of signals transmitted by the WTRU on the UL DCH;

a shared channel target metric generator configured to output UL SCH target metrics derived from received UL DCH target metrics; and

a processor which computes power adjustments as a function of target metrics configured to compute UL DCH power adjustments as a function of the received UL DCH target metric and UL SCH power adjustments as a function of UL SCH target metrics output from the shared channel target metric generator.

17. The invention of claim 16 in which the target metrics are target signal to interference ratios (SIRs), wherein said processor computes power adjustments based on received DCH target SIRs and SCH target SIRs generated by the WTRU's shared channel target metric generator based on received DCH target SIRs and said processor is operatively associated with a transmitter having a combiner configured to combine the computed UL DCH power adjustments with the UL DCH transmission data signals for transmission by the WTRU and a combiner configured to combine the computed UL SCH power adjustments with the UL SCH transmission data signals for transmission by the WTRU.

18. The invention of claim 16 in which the target metrics are target signal to interference ratios (SIRs) and the WTRU is configured for use in a Universal Mobile Telecommunications System (UMTS) that has open loop transmission power control for WTRU transmissions.

19. The invention of claim 18 in which the SCHs for which SCH target SIRs are generated are High Speed Shared Information Channels (HS-SICHs) which operate in conjunction with High Speed Downlink Shared Channels (HS-DSCHs), wherein said processor computes power adjustments based on received DCH target SIRs and HS-SICH target SIRs generated by the WTRU's shared channel target metric generator based on received DCH target SIRs and said processor is operatively associated with a transmitter having a combiner configured to combine the computed UL DCH power adjustments with the UL DCH transmission data signals for transmission by the WTRU and a combiner

configured to combine the computed UL HS-SICH power adjustments with the UL HS-SICH transmission data signals for transmission by the WTRU.

20. A method of outer loop transmission power control for a wireless communication system in which user data is signaled in both shared channels available to unspecified wireless transmit receive units (WTRUs) and dedicated channels that are assigned for use by a specific WTRU in which the WTRU transmits data signals on an uplink dedicated channel (UL DCH) and sporadically transmits data signals on an associated uplink shared channel (UL SCH), the method comprising:

receiving UL user data from WTRUs on UL DCHs and at least one UL SCH and computing target metrics for UL DCHs based on the reception of signals transmitted by a WTRU on an UL DCH associated with an UL SCH usable by the WTRU by a network unit;

generating a respective UL SCH target metric derived from each computed UL DCH target metric; and

in each WTRU, computing UL DCH power adjustments for an UL DCH associated with an UL SCH as a function of UL DCH target metrics computed by said network unit based on the reception of signals transmitted by the WTRU on the UL DCH and computing UL SCH power adjustments for the associated UL SCH as a function of the respective UL SCH target metrics output from the shared channel target metric generator, and transmitting user data on the UL DCH and associated UL SCH at respective power levels corresponding to computed respective UL DCH and UL SCH power adjustments.

21. The method of claim 20 wherein generating a respective UL SCH target metric derived from each computed UL DCH target metric is performed by the network unit.

22. The method of claim 21 in which the target metrics are target signal to interference ratios (SIRs) and open loop transmission power control for WTRU transmissions is implemented further comprising:

transmitting DCH and SCH target SIRs by the network unit; and

receiving, by each of the WTRUs, respective DCH and SCH target SIRs such that the WTRUs compute power adjustments based on received DCH and SCH target SIRs.

23. The method of claim 21 in which the target metrics are target signal to interference ratios (SIRs) and closed loop transmission power control for WTRU transmissions is implemented further comprising:

producing DCH and SCH power step commands as a function DCH target SIRs computed and SCH target SIRs and transmitting DCH and SCH power step commands by the network unit; and

receiving, be each of the WTRUs, respective DCH and SCH power step commands such that the WTRUs compute power adjustments based on received DCH and SCH power step commands.

24. The method of claim 21 in which the target metrics are target signal to interference ratios (SIRs) and the method is implemented in a Universal Mobile Telecommunications System (UMTS).

25. The method of claim 24 in which the network unit is a UMTS Terrestrial Radio Access Network (UTRAN) that implements open loop transmission power control for WTRU transmissions and the SCHs for which SCH target SIRs are generated are High Speed Shared Information Channels (HS-SICHs) which operate in conjunction with High Speed Downlink Shared Channels (HS-DSCHs) further comprising:

transmitting DCH and HS-SICH target SIRs by the UTRAN; and

receiving, by each of the WTRUs, respective DCH and HS-SICH target SIRs such that the WTRUs compute power adjustments based on received DCH and HS-SICH target SIRs.

26. The method of claim 24 in which the network unit is a UMTS Terrestrial Radio Access Network (UTRAN) that implements closed loop transmission power control for WTRU transmissions and the SCHs for which SCH target SIRs are generated are High Speed Shared Information Channels (HS-SICHs) which operate in conjunction with High Speed Downlink Shared Channels (HS-DSCHs) further comprising:

producing DCH and HS-SICH power step commands as a function DCH target SIRs and HS-SICH target SIRs and transmitting DCH and HS-SICH power step commands by the UTRAN; and

receiving, by each of the WTRUs, respective DCH and HS-SICH power step commands such that the WTRUs compute power adjustments based on received DCH and HS-SICH power step commands.

27. The method of claim 20 wherein generating a respective UL SCH target metric derived from each computed UL DCH target metric is performed the WTRUs.

28. The method of claim 27 in which the target metrics are target signal to interference ratios (SIRs) and open loop transmission power control for WTRU transmission is implemented further comprising:

transmitting DCH target SIRs by the network unit; and

receiving, by each of the WTRUs, respective DCH target SIRs such that the WTRUs compute power adjustments based on received DCH target SIRs and SCH target SIRs generated by the WTRUs based on received DCH target SIRs.

29. The method of claim 27 in which the target metrics are target signal to interference ratios (SIRs) and the method is implemented in a Universal Mobile Telecommunications System (UMTS).

30. The method of claim 29 in which the network unit is a UMTS Terrestrial Radio Access Network (UTRAN) that implements open loop transmission power control for WTRU transmissions and the SCHs for which SCH target SIRs are generated are High Speed Shared Information Channels (HS-SICHs) which operate in conjunction with High Speed Downlink Shared Channels (HS-DSCHs) further comprising:

transmitting DCH target SIRs by the UTRAN; and

receiving, by each of the WTRUs, respective DCH target SIRs such that the WTRUs compute power adjustments based on received DCH target SIRs and HS-SICH target SIRs generated by the WTRUs based on received DCH target SIRs.

31. A method for implementing transmission power control by a serving wireless transmit receive unit (WTRU) for other WTRUs where user data is signaled to the serving WTRU by the other WTRUs in both up link (UL) shared channels available to unspecified WTRUs and dedicated UL channels that are assigned for use by a specific WTRU in which the specific WTRU transmits data signals on an uplink dedicated channel (UL DCH) and sporadically transmits data signals on an associated uplink shared channel (UL SCH) and where the other WTRUs each compute UL channel power adjustments for an UL DCH and an associated UL SCH as a function of UL target metrics computed by the serving WTRU, the method comprising:

receiving UL user data from other WTRUs on UL DCHs and at least one UL SCH;

computing target metrics for UL DCHs based on the reception of signals transmitted by a WTRU on an UL DCH associated with an UL SCH usable by the WTRU; and

generating a respective UL SCH target metric derived from each computed UL DCH target metric.

32. The method of claim 31 wherein the computing and generating of target metrics comprises computing and generating of target signal to interference ratios (SIRs).

33. The method of claim 32 wherein the method is implemented in a Universal Mobile Telecommunications System (UMTS) and the serving WTRU is configured as a UMTS Terrestrial Radio Access Network (UTRAN) that implements open loop transmission power control for WTRU transmissions and the SCHs for which SCH target SIRs are generated are High Speed Shared Information Channels (HS-SICHs) which operate in conjunction with High Speed Downlink Shared Channels (HS-DSCHs), the method further comprising:

transmitting DCH and HS-SICH target SIRs whereby said other WTRUs compute power adjustments based on DCH and HS-SICH target SIRs received from the UTRAN.

34. The method of claim 32 wherein the method is implemented in a Universal Mobile Telecommunications System (UMTS) and the serving WTRU is configured as a UMTS Terrestrial Radio Access Network (UTRAN) that implements closed loop transmission power control for WTRU transmissions, the method further comprising:

producing DCH and HS-SICH power step commands as a function DCH target SIRs and HS-SICH target SIRs; and

transmitting DCH and HS-SICH power step commands whereby said other WTRUs compute power adjustments based on DCH and HS-SICH power step commands received from the UTRAN.

35. A method of transmission power control for a wireless transmit receive unit (WTRU) used in a wireless communication system in which user data is signaled in both shared channels available to unspecified WTRUs and dedicated channels that are assigned for use by a specific WTRU in which the WTRU transmits data signals on an uplink dedicated channel (UL DCH) and sporadically transmits data signals on an associated uplink shared channel (UL SCH), the method comprising:

receiving target metrics for the UL DCH that have been computed based on the reception of signals transmitted by the WTRU on the UL DCH;

generating UL SCH target metrics derived from received UL DCH target metrics; and

computing UL DCH power adjustments as a function of the received UL DCH target metric and UL SCH power adjustments as a function of UL SCH target metrics.

36. The method of claim 35 in which the target metrics are target signal to interference ratios (SIRs), wherein the WTRU computes power adjustments based on received DCH target SIRs and SCH target SIRs generated by the WTRU based on received DCH target SIRs and the WTRU combines the computed UL DCH power adjustments with the UL DCH transmission data signals for transmission by the WTRU and combines the computed UL SCH power adjustments with the UL SCH transmission data signals for transmission by the WTRU.

37. The method of claim 35 wherein the computing and generating of target metrics comprises computing and generating target signal to interference

ratios (SIRs) and the WTRU is configured for use in a Universal Mobile Telecommunications System (UMTS) that implements open loop transmission power control for WTRU transmissions.

38. The method of claim 37 in which the SCHs for which SCH target SIRs are generated are High Speed Shared Information Channels (HS-SICHs) which operate in conjunction with High Speed Downlink Shared Channels (HS-DSCHs), wherein the WTRU computes power adjustments based on received DCH target SIRs and HS-SICH target SIRs generated by the WTRU based on received DCH target SIRs , combines the computed UL DCH power adjustments with the UL DCH transmission data signals for transmission by the WTRU and combines the computed UL HS-SICH power adjustments with the UL HS-SICH transmission data signals for transmission by the WTRU.